

Imperial College London

**Information & Communications Technology
Network Infrastructure Group**

Network Infrastructure Standards
January 2018

Appendix I – Active equipment

Version 1.5

Appendix I – Active equipment

1.0 Introduction

This section details the standards for active equipment.

2.0 Wireless Access Points (WAPs)

All refurbishment or build projects will include as a standard WAP installations.

2.1 Planning

The fact that the WAPs can only use three discrete frequencies in the 2.4 GHz Band limits the density of installation of these devices and will entail the planning of a full building installation rather than a device at a time and/or a specific room or rooms.

The construction materials and the equipment used in a particular instance will have a bearing on how the installation will be designed; therefore this process needs to be carried out in close coordination with the ICT department, who will provide the wireless design for all areas.

2.2 Construction materials

The radio emissions from the WAPs will travel for an estimated 25m before degrading the signal to levels below what the College would accept for data connectivity. This is in clear space and may be significantly impacted by the materials used in the building construction.

2.3 Current equipment specification

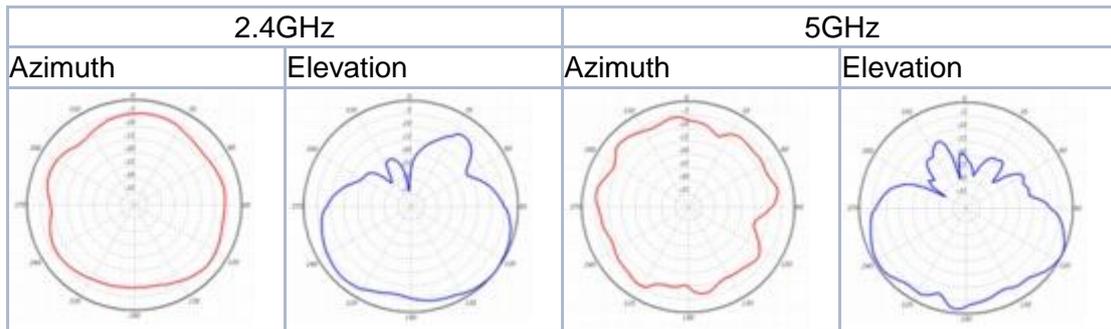
Imperial College ICT will specify the type of equipment to be provided in any given area.

A clearance of 4cm is needed at the top in order to slide the front panel open and to mount the unit on the mounting plate.

Coverage

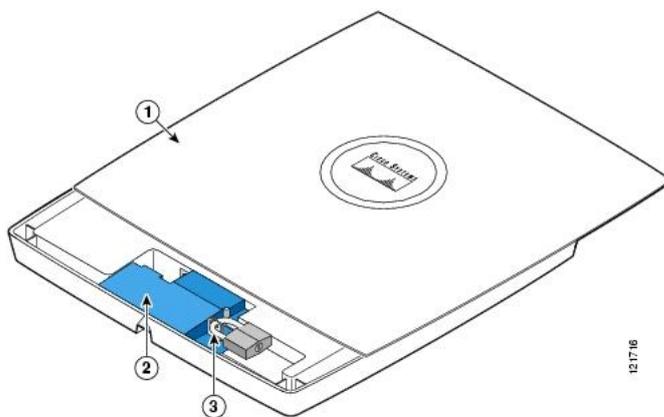
Coverage is directional, perpendicular to the front panel of the unit, and 360 degrees in the plane of the unit. The consequence is that if it is mounted on a ceiling pointing down coverage is in all directions on the floor. If mounted on a wall coverage is in the direction away from the wall.

For an AP mounted on the ceiling, pointing down -



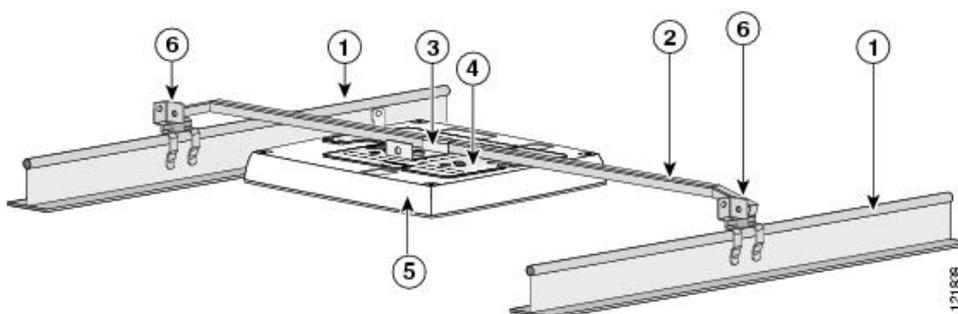
Mounting

The supplied mounting kit comprises a mounting plate and optional parts for attaching to a ceiling grid. The Access Point can then be locked to the mounting plate with a padlock that is concealed within the body of the unit.



It is strongly preferred that the unit is not mounted behind anything or above ceiling tiles as this will reduce the range of the wireless network. Metal and Metal-foil building materials will severely impede the wireless signal.

If after agreement with ICT, the unit is mounted above a suspended ceiling, a suitable t-rail must be provided. (See below). The ceiling tiles must not be metal / metal backed in this instance, as this will block the signal from the access point.



Power

The access points support 802.1af PoE (Power over Ethernet). No mains power outlet is required at the Access Point. For legacy installations we may provide power using a Power Injector.

For newer installations the WAPs will be powered from a PoE Ethernet switch.

Currently the Cisco lightweight implementation is being rolled out in the College. Any wireless design will be done by Imperial College's ICT department.

2.4 Procurement

As a part of the service ICT provides to the College all equipment will be procured and configured by ICT. All projects and or any other activities that will require the installation of WAPs in College must contact ICT at least 3 weeks in advance to ensure stock availability,

2.5 Installation

The physical attachment and local connection of the WAPs onsite will be carried out by the project's cabling contractors or by the contractors ICT has appointed to carry such works on behalf of a requesting department.

3.0 Switches

Imperial College ICT will specify the type of equipment to be provided in any given area.

3.1 Wired networking overview

The wired network is considered to be the "production" network in the College and it is only via this connection that access to the full spectrum of applications available on the College network will be granted.

Socket installations throughout the College will follow the basic principle of "wire flooding", which implies the installation of the maximum number of sockets required for foreseeable future use of the location. In contrast "flood patching", where all sockets would be connected to an active port on active equipment (switches), will not typically be employed.

There are exceptions to this rule such as public areas in the College that are designed to accommodate students and staff on a temporary basis, computer labs, etc... In these areas, the ports will be "flood patched".

For an example on how to calculate the number of switches needed, see "Appendix B – Examples".

3.2 Planning

In most projects and on daily operations it is difficult to forecast the number of active ports required by the faculties or client groups at the beginning. However experience leads to the rule of thumb that an average of one third of the sockets will be made live (currently being revised upwards to one half).

3.3 Procurement

As a part of the service ICT provides to the College all equipment will be procured and configured by ICT. All projects and or any other activities that will require the installation of switches in the College must contact ICT at least 3 weeks in advance to ensure stock availability.

Note: The ICT Department will charge the cost of the installed services rather than for the hardware itself. The ownership of the equipment remains within ICT. The costs provided will cover ICT's purchase and nothing else.

3.4 Installation

The physical placement of the switches and their connectivity will fall within the scope of the ICT department.

Please see item "2.3 Room construction and fit out" and "Appendix C – CWC" for cabinet and CWC requirements to be fulfilled before any switch can be installed by ICT.